REDCap for Improved M&E of Voluntary Medical Male Circumcision Outreach

Vi Tran

A thesis

submitted to partial fulfillment of the

requirements for the degree of

Master of Public Health

University of Washington

2021

Committee:

Caryl Feldacker

Bryan Weiner

Program Authorized to Offer Degree:

Health Services

©Copyright 2021

Vi Tran

University of Washington

Abstract

REDCap for improved M&E of voluntary medical male circumcision outreach

Vi Tran

Chair of the Supervisory Committee:

Caryl Feldacker

Department of Global Health

Introduction

Voluntary Medical Male Circumcision (VMMC) reduces HIV transmission rate by up to 60%. There is a great need for VMMC services in Zimbabwe, where the HIV prevalence is one of the highest in the world at 12.9%. The ZAZIC consortium was founded in 2013 to expand VMMC services in Zimbabwe. In 2019, ZAZIC transitioned its VMMC outreach data collection practices from weekly paper forms to daily electronic forms submitted via REDCap, aiming to optimize data collection and decrease reporting errors and confidentiality risks.

Methods

This convergent mixed-methods, retrospective, cross-sectional analysis evaluates the transition to electronic data collection to aid VMMC program monitoring and evaluation (M&E) in Zimbabwe between July 2019 and March 2020. Study 1 assessed organizational uptake of utilizing electronic data collection via RedCap for routine VMMC program monitoring in

Zimbabwe using the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework. Study 2 identified factors contributing to VMMC program success using a mixed-methods analysis.

Results

RE-AIM analysis established REDCap as an effective data collection tool with improved data quality. Results from linear regression models revealed program factors such as increased outreach resources and community-based demand creation were significantly associated with VMMCs throughout ZAZIC and within the target 15-29 age group. Qualitative analysis provided further insight to quantitative results by providing explanations as to why factors such as demand creation were so successful in increasing outreach.

Conclusion

REDCap is effective for VMMC outreach data collection. These findings will inform future program monitoring and evaluation practices among ZAZIC partners.

Table of Contents

List of Tables……………..……………..……………..……………..…..………..….……..……ii

List of Figures…………..……………..……………..……………..…..…...…..………..…...…iii

List of Abbreviations…………..……………..……………..…..………..….…………...…………iv

Chapter 1. General Introduction..……………..…..………..………………….……..…..…...…1

Chapter 2. Evaluating REDCap feasibility and uptake among ZAZIC partners using the RE-AIM Framework…………………..………………….……………….………...………...…...…4

Chapter 3. A mixed-methods study of facilitators and barriers to VMMC productivity and program success……………………………………….…………...……………….………16

Chapter 4. Conclusion and Future Directions…………..……....……………..…………...………31

References….……………...……….....……………….………………...………..……………….……...33

Tables….……………...…………....……….……………………………………...………....………36

Appendix A: Paper Form…………….…………...……………...…………………..…………...43

Appendix B: REDCap Form…….………………....…..……………...……………..…………...………45

List of Tables

Table 1: *Descriptive Statistics of outreach characteristics by partner*……………………..…….36

Table 2. *Results from univariate and multivariate linear regression models assessing program factors affecting total VMMCs by Partner*……………………….……..………………...37

Table 3: *Results from univariate and multivariate linear regression models assessing program factors affecting total VMMCs on clients 15-29 by Partner*……………….……....……..…38

Table 4: *Comparison of Demand Creation and Giveaway Frequency by Partner*……......……..39

Table 5: *Results from univariate and multivariate linear regression models assessing Demand Creation activities affecting total VMMCs by Partner*…………..……..………..……....40

Table 6*: Results from univariate and multivariate linear regression models assessing Demand Creation activities affecting total VMMCs on clients 15-29 by Partner*…………..….…..41

Table 7: *Interpretation of convergent mixed-methods results*……………………………….……42

List of Figures

Figure 1. *REDCap reports submitted per month by program partner*……………...………..……..7

Figure 2. *Average completion rate of paper forms and REDCap forms by ZACH and ZICHIRE*……………………………………………………………………………...…8

Figure 3. *Average completion rate of paper forms and REDCap forms by ZACH and ZICHIRE, staffing data omitted*….…………………………………………………………..……………...9

Figure 4. *REDCap Implementation among VMMC roving team nurses*……………..…..……….10

Figure 5. *Average completion rate of REDCap forms before and after mandating fields*…...……11

Figure 6. *Average completion rate of REDCap forms before and after mandating fields, one nurse removed*………………………………………………………………………12

List of Abbreviations

AE	Adverse Event
DC	Demand Creation
I-TECH	International Training and Education Center for Health
REDCap	Research Electronic Data Capture
ZACH	Zimbabwe Association of Church-related Hospitals
ZAZIC	Consortium name comprised of partners, ZACH, ZICHIRE, I-TECH
ZICHIRE	Zimbabwe Community Health Intervention Project
VMMC	Voluntary Medical Male Circumcision

Acknowledgements

I would like to express my deepest appreciation to my committee chair Dr. Caryl Feldacker for your endless mentorship, encouragement and support throughout this thesis process. Your confidence in me has been the biggest motivator during an extraordinarily unpredictable graduate school experience. Thank you to Dr. Bryan Weiner for your invaluable guidance on implementation science and for serving on my thesis committee. Thank you to the entire ZAZIC team for embracing me and giving me the privilege to learn about your magnificent achievements and determination to reducing HIV transmission in Zimbabwe.

Thank you to my incredible support system as I navigated the highs and the lows of completing graduate school during a pandemic. To my parents, Lily Tran and Phung Tran, and my brother, Quang Tran, for your sacrifices and unconditional support as I navigate these chapters of my life. Thank you to Megan Fantes for your statistical brilliance, pure optimism, and selfless generosity during our many hours of statistics consulting and tutoring. Thank you, Kate Westfall, Jordan Maharaj, and Kelsey Cabrera for keeping me centered throughout grad school.

Last, thank you to Aaron Antone. I am forever grateful for having you by my side during a year that called for more resilience than it did R&R. Your unwavering support and relentless humor created an environment where I felt safe, protected, and inspired. Thank you for welcoming me into your life and for the many, many meals delivered.

Dedication

For my parents, Lily and Phung Tran, for allowing Quang and me all the opportunities we could ever dream of. This degree is as much yours as it is mine.

Chapter 1. General Introduction

VMMC for HIV Prevention

HIV/AIDS continues to be a leading cause of disease burden and death in sub-Saharan Africa. Studies show that voluntary medical male circumcision (VMMC) is a safe, cost-effective procedure that reduces the spread of HIV through sexual transmission by up to 60% (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007). To reduce the spread of HIV, the World Health Organization (WHO) has set a target to circumcise 80% of men in 14 priority countries with high HIV burden(UNAIDS, 2011).

ZAZIC

Zimbabwe has one of the highest adult prevalence of HIV/AIDS in the world, with a prevalence of 12.9%(Ministry of Health and Child Care, 2020). Despite efforts by the Zimbabwe Ministry of Health and Child Care (MoHCC) to increase VMMC services, progress was slow. In 2012, Zimbabwe had completed only 4.8% of its intended 1.9 million VMMC goal(World Health Organization, 2013).

To address this, the University of Washington I-TECH, funded by the Centers for Disease Control and Prevention, USA (CDC) through the US President's Emergency Plan for AIDS Relief (PEPFAR), collaborated with the Zimbabwe MoHCC to establish ZAZIC in 2013. ZAZIC is a consortium of three local partners tasked with providing VMMC services to underserved districts throughout Zimbabwe. I-TECH at the University of Washington provides overall oversight, administration, and evaluation. I-TECH Zimbabwe is a local partner providing local oversight, administration, and evaluation. ZACH and ZICHIRE are independent subcontractors providing local management and VMMC implementation (Feldacker et al., 2018). Since 2013, ZAZIC has

provided VMMC services to over 36 sites in 13 districts and has successfully performed over 500,000 VMMCs.

REDCap

In 2019, ZAZIC transitioned its VMMC outreach data collection practices from weekly paper forms to daily electronic forms submitted via REDCap. REDCap is a secure, web-based electronic data collection tool often used in clinical and research settings (Harris et al., 2009). Previously, ZAZIC had roving team leaders submit data weekly by completing paper forms that a central partner clerk would later enter manually into an Excel table (see Appendix A). This process was prone to error and time consuming, leading to delays and barriers to data delivery for program monitoring and evaluation (M&E). Data collection via REDCap allows ZAZIC roving team leaders to complete and submit data electronically through REDCap's mobile app, which can continue collecting data despite network interruptions (see Appendix B).

Objective & Aims

REDCap is frequently used in clinical and research settings. However, it is unknown whether REDCap is suited for mobile VMMC program delivery for ZAZIC, where outreach is often done in hard to reach districts with infrastructure challenges. Furthermore, because paper data collection had previously been prone to error or slow to report, data on ZAZIC's outreach operations was not used to inform VMMC program delivery, limiting the application of program data for decision making.

This study is a convergent mixed-methods, retrospective, cross-sectional analysis evaluating the transition to electronic data collection to aid VMMC program M&E in Zimbabwe between July 2019 and March 2020. This study aims to:

1. Assess organizational uptake of utilizing electronic data collection via REDCap for routine VMMC program monitoring in Zimbabwe using the RE-AIM framework
2. Identify factors that contribute to VMMC program success in the outreach setting.
3. Identify factors contributing to or detracting from VMMC program productivity.

Overall, this evaluation will inform ZAZIC's REDCap sustainability and make recommendations on ways to improve data collection, patient care, and program outcomes.

Chapter 2. Evaluating REDCap feasibility and uptake among ZAZIC partners using the RE-AIM Framework

Introduction

Large scale healthcare programs such as ZAZIC require efficient, high-quality data to maintain program operations and patient safety. VMMC programs must maintain accurate data practices to track progress towards target goals. However, in low-resource settings such as Zimbabwe, data collection can be challenging. Timely data collection and delivery is especially difficult for programs such as ZAZIC, where program staff must travel far distances to reach clients. Furthermore, ZAZIC staff expressed concern that paper based data collection methods were prone to error, were time consuming to complete, and were prone to confidentiality risks.

Launched in 2015, the REDCap Mobile App allows users to capture data offline, making it ideal for settings such as Zimbabwe, where the internet connectivity can be unpredictable. Previous studies show that the REDCap mobile app can improve data management approaches in countries with limited access to internet access (Ndlovu et al., 2019). The REDCap Mobile App is connected to a REDCap server, an open source platform providing secure, web-based data capturing (Harris et al., 2009). In 2019, ZAZIC transitioned from data collection using paper based methods to using the REDCap Mobile App. While the REDCap Mobile App has been evaluated as a health data collection method in other countries lacking sufficient internet access, it has not been developed and evaluated as a part of VMMC outreach in Zimbabwe.

In this study, the RE-AIM framework was used to evaluate REDCap uptake and usability among ZAZIC's two roving teams, ZACH and ZICHIRE. The Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework is commonly used in implementation science to evaluate public health and health promotion interventions (Glasgow et al., 1999). This

framework assesses the public health impact of an innovation by using the five components to better understand both the successes and failures of implementation. In this study, the RE-AIM framework was used to establish a comprehensive understanding of the impact the REDCap Mobile App had on addressing the limitations of paper-based data collection methods by ZAZIC.

Methods

Reach

Reach was defined as the number of REDCap outreach reports submitted per month. Program nurses submitted REDCap reports after each outreach visit from July 2019 to March 2020 using a mobile phone with the REDCap mobile app installed.

Effectiveness

Effectiveness was defined by the impact of REDCap on outreach data form completeness compared to traditional paper-based data collection methods. Completeness was calculated by the number of variables with data recorded in an observation relative to the total number of variables in that observation. For both ZACH and ZICHIRE, a two sample, one-tailed t-test was conducted to ascertain whether the completeness mean difference between REDCap and paper was greater than 0. It was hypothesized that forms submitted via REDCap yielded a higher completeness average than forms submitted using paper-based data collection methods.

Adoption

Adoption was measured at the ZAZIC program nurse level by determining the number of REDCap reports each outreach nurse submitted per month between July 2019 and March 2020.

Implementation

REDCap was implemented through coordination, training, and feedback between ZAZIC and the University of Washington I-TECH team. After designing and testing the REDCap mobile

app for ZAZIC, REDCap was piloted in 4 sites from July-September 2019 before expanding to all ZAZIC sites in October 2019. Sites and ZAZIC roving nurses received training on accessing and submitting data through REDCap both online and through the mobile app. REDCap implementation was measured by the average number of reports nurses submitted each month.

Maintenance

COVID-19 restrictions paused all ZAZIC outreach events and procedures in March 2020, just six months after implementing REDCap for data collection. As a result, maintenance was difficult to measure. Maintenance was characterized by ZAZIC's *intention* to continue REDCap use once VMMC procedures continued, indicated by communication, feedback, and ownership between ZAZIC and the University of Washington throughout the VMMC program interruption period.

During this program interruption, ZAZIC informed the University of Washington I-TECH team that despite transitioning to REDCap, data collection was still incomplete and missing values. REDCap was updated to indicate critical fields mandatory. When VMMC procedures resumed, roving nurses were given the updated REDCap forms with mandated fields to complete. A two-sample, one-tailed t-test was for whether the mean completeness of REDCap forms before and after mandating fields was greater than 0.

Results

Reach

ZAZIC partners submitted 1,773 reports via REDCap from July 2019 to March 2020 (Fig. 1). Of these reports, 960 (54%) reports were submitted by ZACH and 813 (46%) reports were submitted by ZICHIRE. 34 nurses participated in submitting forms and recorded 26,851 male circumcisions (16,122 from ZACH, 10,729 from ZICHIRE). November 2019 resulted in the highest REDCap report yield, with 406 reports submitted (158 ZICHIRE, 248 ZACH). July was the first month of REDCap piloting and had the lowest number of reports submitted (9 ZICHIRE, 11, ZACH). Notable decreases in REDCap report submission occurred in December and March by both partners.

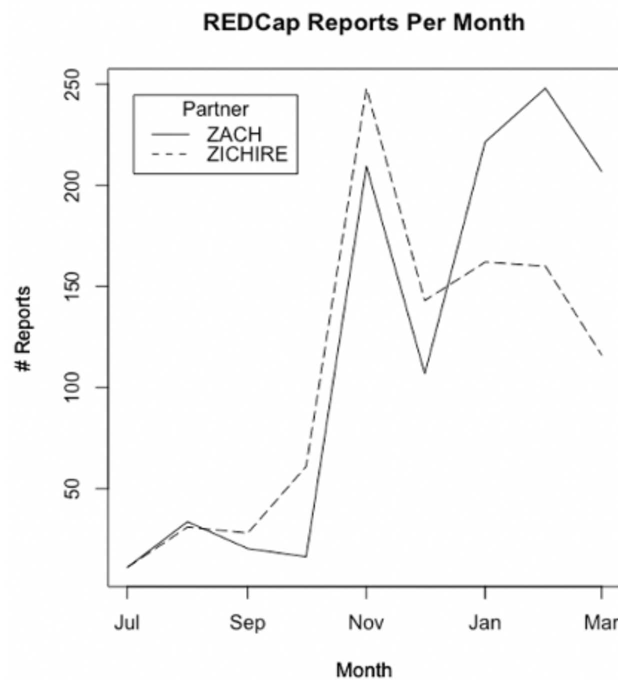

Fig. 1 REDCap reports submitted per month by program partner. From July 2019 – March 2020, ZACH roving team leaders submitted 960 REDCap reports and ZICHIRE roving team leaders submitted 813 reports.

Effectiveness

A significant increase in average completeness was observed only in REDCap forms submitted by ZICHIRE, and a decrease in average completeness in forms submitted by ZACH (Fig. 2). For ZACH, the average difference in % completion between forms submitted using REDCap and paper forms was -12.6% (Fig. 2a). This difference was not found to be statistically significantly greater than 0 (96% CI: [-14.0, Inf], p = 1). For ZICHIRE, the average difference in % completion rate increased by 4.1% when data entry transitioned from paper forms to REDCap (Fig. 2B). This difference was statistically significantly greater than 0. (95% CI: [3.2%, Inf], $p <$ 0.001).

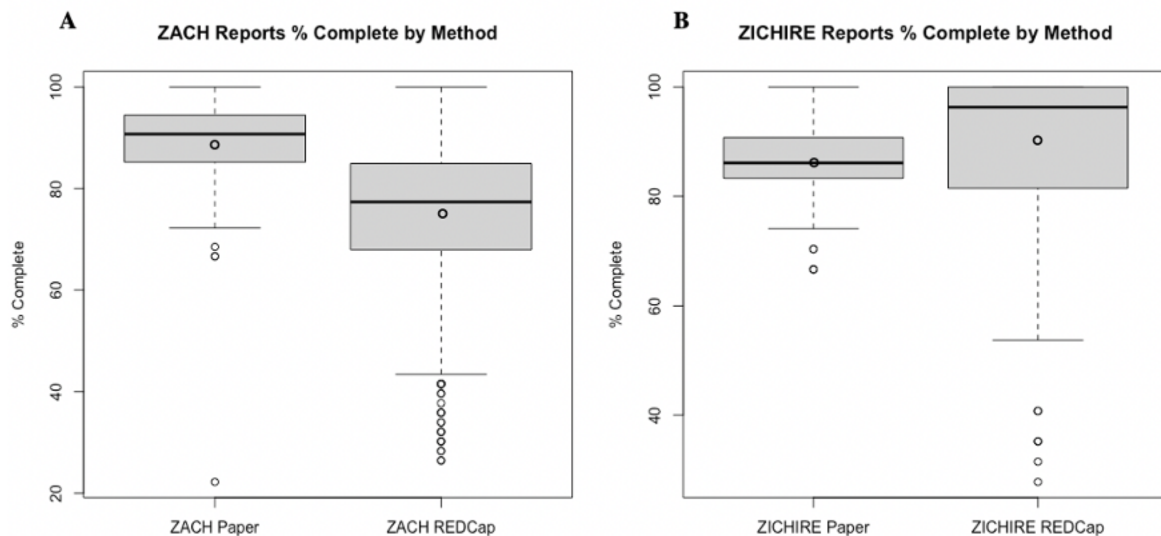

Fig. 2 Average completion rate of paper forms and REDCap forms by ZACH and ZICHIRE. (A) Average completion rate of ZACH paper forms was 89.2%, N = 161. Average completion rate of ZACH REDCap forms was 76.6%, N = 960. ZACH REDCap mean is not significantly greater than ZACH paper mean (p = 1, one-tailed t-test). Error bars indicate 95% confidence interval. (B) Average completion rate of ZICHIRE paper forms was 86.2%, N = 170. Average completion rate of ZICHIRE REDCap forms was 90.3%, N = 813. ZICHIRE REDCap mean is significantly greater than ZACH paper mean ($p < 0.05$, one-tailed t-test). Error bars indicate 95% confidence interval.

ZACH data completeness did not increase with REDCap implementation. Upon further review, data entry inconsistencies for both ZICHIRE and ZACH were primarily found in data entry for outreach staffing, with multiple fields left blank. The analysis was repeated with staffing data

omitted to ascertain REDCap's influence on data entry completeness for both ZACH and ZICHIRE (Fig.3).

The average difference in percentage (%) completed between paper forms and REDCap forms was significantly greater than 0 for both ZACH and ZICHIRE. The average % complete ZACH data entry forms increased by 4.6% after transitioning to REDCap forms (Fig. 3a). This difference was found to be statistically significantly greater than 0 (95% CI: [3.1, Inf], $p < 0.05$). Among ZICHIRE, the average % completeness of forms increased by 14.9% after implementing REDCap (Fig. 3b). This difference was statistically significantly greater than 0. (95% CI: [13.7%, Inf], $p < 0.05$).

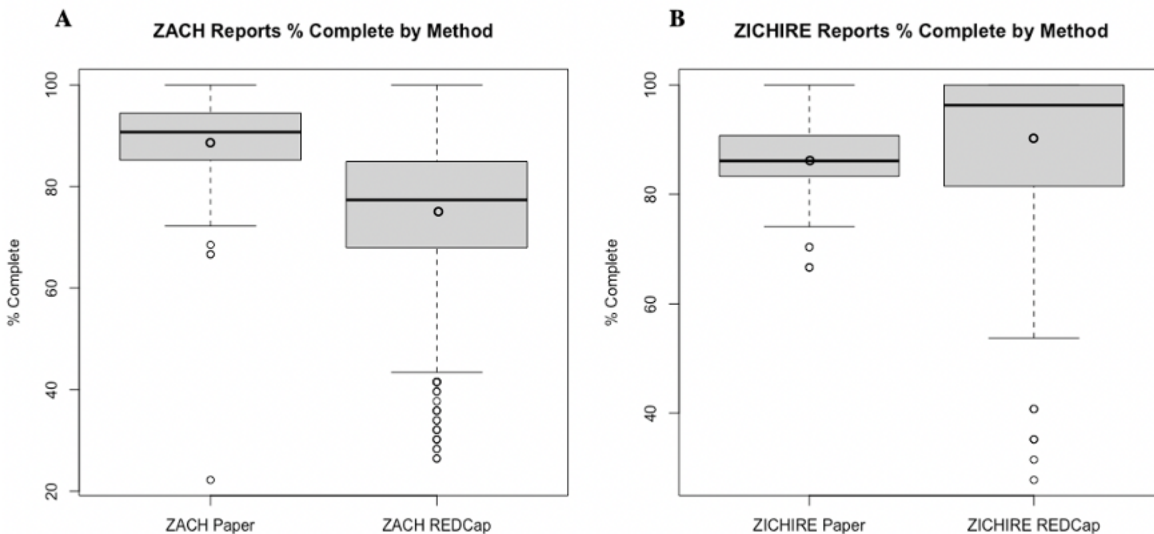

Fig. 2 Average completion rate of paper forms and REDCap forms by ZACH and ZICHIRE. (A) Average completion rate of ZACH paper forms was 89.2%, N = 161. Average completion rate of ZACH REDCap forms was 76.6%, N = 960. ZACH REDCap mean is not significantly greater than ZACH paper mean ($p = 1$, one-tailed t-test). Error bars indicate 95% confidence interval. (B) Average completion rate of ZICHIRE paper forms was 86.2%, N = 170. Average completion rate of ZICHIRE REDCap forms was 90.3%, N = 813. ZICHIRE REDCap mean is significantly greater than ZACH paper mean ($p < 0.05$, one-tailed t-test). Error bars indicate 95% confidence interval.

Adoption

Once implemented in July 2019, ZAZIC mandated all outreach nurses use REDCap for data collection, resulting in 100% adoption by ZAZIC program staff and discontinuation of paper-based reporting.

Implementation

REDCap implementation was measured by the average number of reports nurses submitted each month (Fig. 4). During this period, 17 ZACH nurses submitted an average of 11 REDCap reports per month (Fig. 4a) and 17 ZICHIRE nurses submitted an average of 12 reports per month (Fig. 4b). Despite 100% intended adoption, there were noticeable decreases in the average number of reports submitted per nurse in October 2019 for both ZAZIC partners and December 2019 among ZICHIRE nurses.

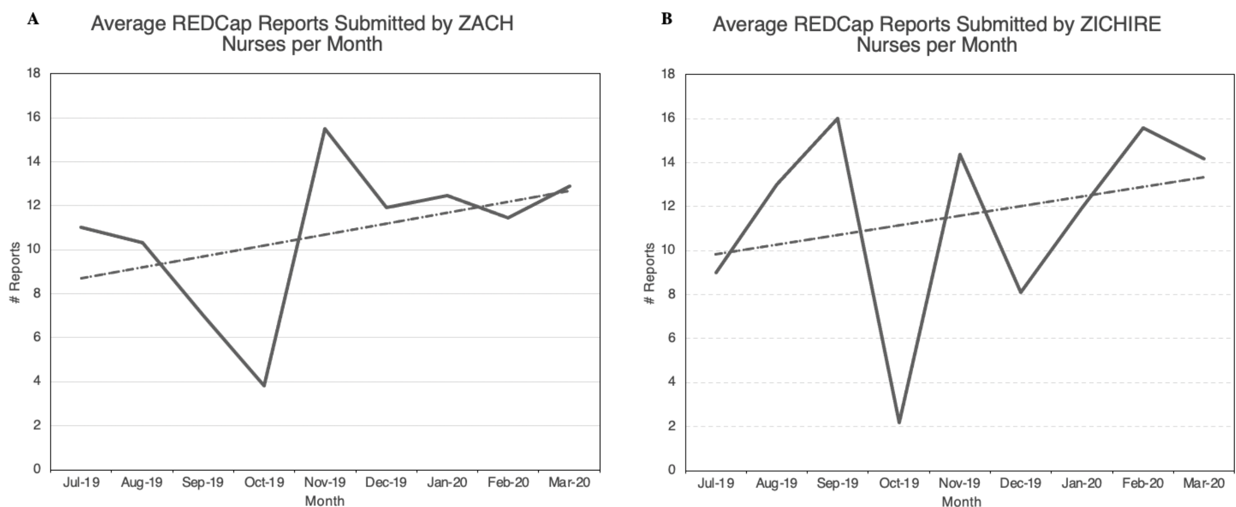

Fig. 4 REDCap Implementation among VMMC roving team nurses. (A). Average reports submitted per month by 17 ZACH roving team nurses. ZACH nurses submitted a total of 960 reports from July 2019 to March 2020, with each nurse submitting an average of 11 reports per month. (B) Average reports submitted per month by 17 ZICHIRE roving team nurses. ZICHIRE nurses submitted a total of 813 reports from July 2019 to March 2020, with each nurse submitting an average of 12 reports per month.

Maintenance

In reviewing REDCap form completeness, an average % of form completeness was expected to be at or near 100%. However, the average % completeness of REDCap forms was

76.6% for ZACH and 90.3% for ZICHIRE. This was attributed to not marking critical fields mandatory on REDCap forms. During the program interruption due to COVID-19, REDCap forms were updated to highlight mandatory fields and encourage respondents to fully enter outreach data. It was hypothesized that marking REDCap form fields mandatory would increase this average % completeness. Mandating fields increased average % completeness only in REDCap forms submitted by ZICHIRE and not in forms submitted by ZACH (Fig. 5).

From October 2020 to March 2021, ZACH submitted 108 REDCap reports. The average % completion in REDCap forms submitted by ZACH increased by 2.8% after marking fields mandatory (Fig. 5A). However, this difference was not statistically significantly greater than 0 (95% CI: [-0.44, inf], $p = 0.08$). ZICHIRE submitted 21 REDCap reports between October 2020 and March 2021. The average % completion of these forms increased by 7.4% after updating forms to mandate fields (Fig. 5B). This difference was statistically significantly greater than 0 (95% CI: [6.4, Inf], $p < 0.05$).

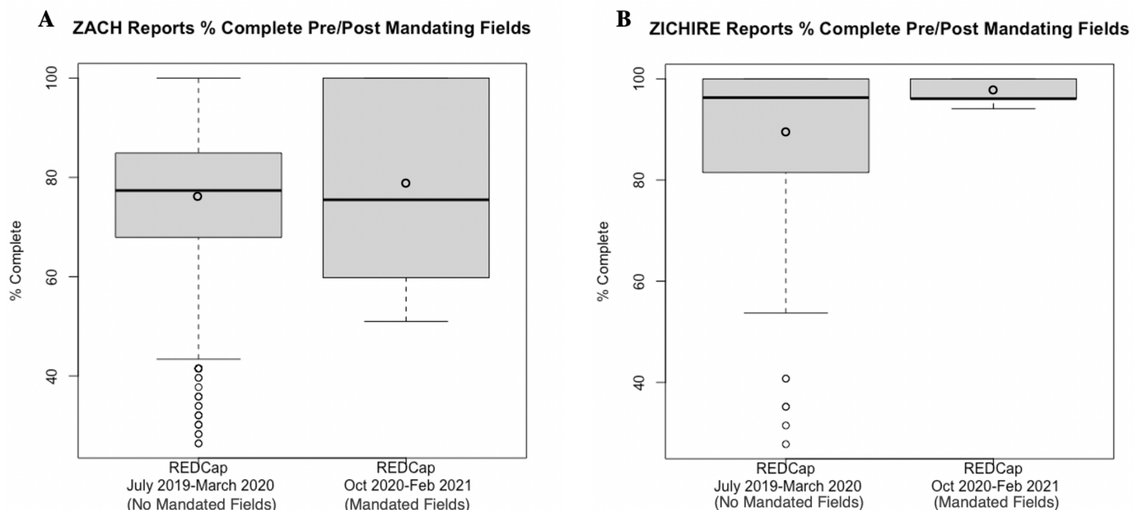

Fig. 5 Average completion rate of REDCap forms before and after mandating fields. (A) Average completion rate of ZACH REDCap forms prior to mandating fields was 76.6%, N = 960. Average completion rate of ZACH REDCap forms after mandating fields was 79.4%, N = 108. The average % completion of forms mandating fields was not statistically significantly greater than forms not mandating fields ($p = 0.08$, one-tailed t-test). (B) Average completion rate of ZICHIRE REDCap forms prior to mandating fields was 90.3%, N = 813. Average completion rate of ZICHIRE REDCap forms after mandating fields was 97.7%, N = 21. The average % completion of forms mandating fields was statistically significantly greater than forms not mandating fields ($p < 0.05$, one-tailed t-test).

Upon further review of ZACH data, one individual was found to have submitted 50% of all REDCap forms between October 2020 to March 2021. Of these reports submitted by this individual, the completion average was only 60.3%. To gather a better understanding of the effect of mandating fields in REDCap among ZACH roving team nurses, the analysis was repeated with this particular individual's responses omitted. In this calculation, 51 ZACH REDCap reports showed an average completion rate of 99.1% (Fig. 6). This average % completion was statistically significantly greater than 0 (95% CI: [21.6*,* Inf], $p < 0.05$).

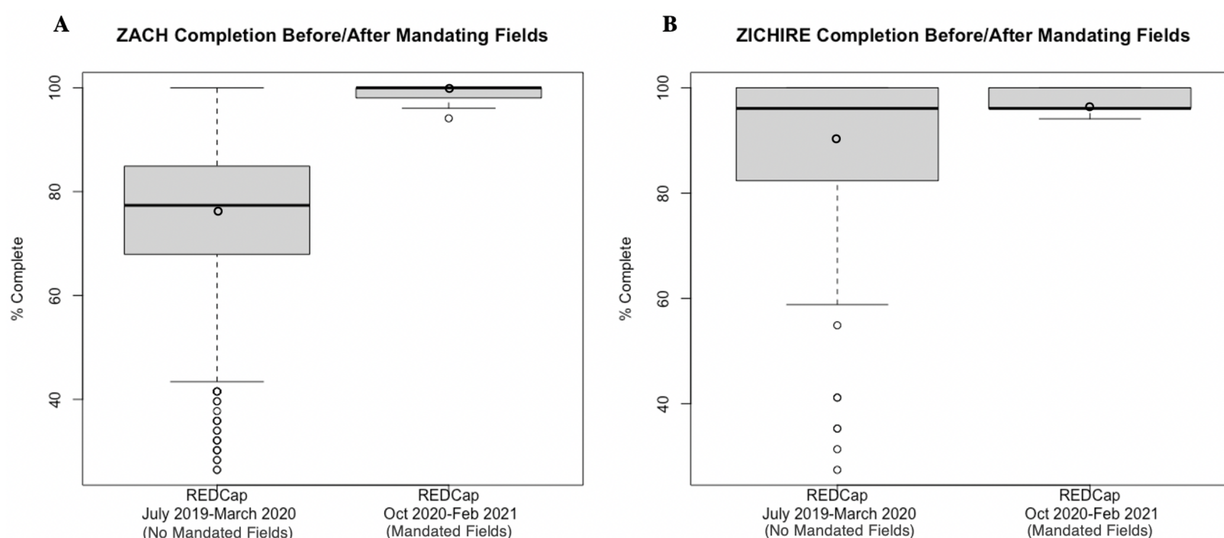

Fig. 6 Average completion rate of REDCap forms before and after mandating fields, one nurse removed. (A) Average completion rate of ZACH REDCap forms prior to mandating fields was 76.6%, N = 960. Average completion rate of ZACH REDCap forms after mandating fields was 99.1%, N = 51. The average % completion of forms mandating fields was statistically significantly greater than forms not mandating fields ($p < 0.05$, one-tailed t-test). (B) Average completion rate of ZICHIRE REDCap forms prior to mandating fields was 90.3%, N = 813. Average completion rate of ZICHIRE REDCap forms after mandating fields was 97.7%, N = 21. The average % completion of forms mandating fields was statistically significantly greater than forms not mandating fields ($p < 0.05$, one-tailed t-test).

Discussion

This analysis using the RE-AIM framework supports the hypothesis that mobile, electronic data collection for ZAZIC outreach monitoring and evaluating results in higher data quality compared to paper-based forms. These results indicate that electronic data collection is feasible in countries with limited internet access.

As expected, REDCap usability is encouraging, based on reach and adoption by program nurses. REDCap was effective in addressing data quality concerns by increasing data completeness compared to paper-based forms. REDCap implementation was also successful, based on the average number of reports submitted each month per nurse.

It was hypothesized that digitizing ZAZIC data collection using REDCap would increase the completeness of outreach data forms submitted by roving team site leaders. Contrary to expected results, the initial analysis indicated a significant increase in average completeness was observed only in REDCap forms submitted by ZICHIRE, and a decrease in average completeness in forms submitted by ZACH (Fig. 2). This was attributed to two issues. First, data fields were not marked mandatory in REDCap indicated required data. Second, ZAZIC outreach staff had habitually left irrelevant staffing fields blank rather than "0" on paper forms. This likely continued when ZAZIC transitioned to REDCap. Suprisingly, REDCap did not result in 100% data completion even after fields were mandated. As previously stated, this was attributed to REDCap data fields not marked mandatory. While REDCap improved data collection overall, these results indicate a need for increased training and supervision among staff using REDCap.

Among the most promising indicators of maintaining REDCap in ZAZIC outreach monitoring was that ZAZIC staff indicated intention to continue and improve upon REDCap once outreach events return to capacity. Throughout the pause on outreach due to COVID-19 restrictions, ZAZIC maintained communication with I-TECH, requesting changes and improvements to REDCap. This updated form was launched in October 2020, as COVID-19 restrictions slowly lifted and VMMC procedures resumed. This correspondence indicates that ZAZIC is motivated to maintain and sustain REDCap as a data collection tool despite

unprecedented challenges to outreach. Continuing REDCap data collection will likely positively affect ZAZIC program monitoring and VMMC outreach.

As VMMC outreach continues, several recommendations should be considered. First, ZAZIC should continue using the REDCap Mobile App for data collection in favor of paper-based forms. Outreach staff should also be re-trained on all facets of the platform including accessing the app and submitting complete data for required fields. Finally, ZAZIC program monitors should review REDCap data for quality regularly to quickly identify opportunities for increased training and supervision.

Limitations

Integrating REDCap into ZAZIC outreach was not without challenges. First, the observation period for REDCap was interrupted by COVID-19 halting VMMC opportunities throughout Zimbabwe. The data were limited to only 9 months, and the observation period overlapped with holidays and seasonal weather challenges, resulting in reduced opportunities for REDCap reporting. Second, the reliability of these data were impacted by inconsistent data entering of paper forms into excel. Finally, one individual's data heavily skewed REDCap data and was omitted from the analysis as to not bias results. This indicates a need for increased REDCap training and supervision. Despite these challenges, the results from integrating REDCap demonstrate ZAZIC's ability to improve and sustain good data collection practices and meet program monitoring expectations.

Conclusion

Overall, the REDCap mobile app for ZAZIC VMMC data collection successfully reached and was adopted and implemented by ZAZIC program staff. REDCap was also effective in addressing the completion concerns from using paper forms, by significantly increasing the

completion of forms submitted. REDCap's secure platform and ability to collect data offline also addresses concerns from paper reporting. Last, while REDCap maintenance was difficult to fully ascertain due to interruptions by COVID-19 social distancing guidelines, it was determined that ZAZIC is motivated to continue using and improving REDCap for program monitoring and evaluation. As ZAZIC continues integrating REDCap into outreach and training staff on using the tool, REDCap has the potential to greatly improve ZAZIC outreach program monitoring.

Chapter 3. A mixed-methods study of facilitators and barriers to VMMC productivity and program success

Introduction

Clinical trials show that VMMC reduces the probability of HIV infection by 60% (site). These studies support the scale-up of VMMC programs in Zimbabwe, where the HIV prevalence is high. By setting a target to circumcise 80% of men ages 10 to 29 years, an estimated 212,000 HIV infections would be prevented and $1.13 billion saved in health care costs through 2025 (Ministry of Health and Child Care, 2019)

Founded in 2013, ZAZIC is a consortium consisting of I-TECH Zimbabwe (now Zim-TTECH) and implementing partners Zimbabwe Association of Church related Hospitals (ZACH) and Zimbabwe Community Health Intervention Project (ZICHIRE). In 2020, ZAZIC implements and monitors VMMC services in 14 districts throughout Zimbabwe and completed over 500,000 circumcisions in hard to reach areas.

One of ZAZIC's key priorities is to expand access to VMMC services to hard to reach areas in Zimbabwe while also maintaining quality assurance and safety. While the previous chapter shows that electronic data capture via the REDCap mobile app improved ZAZIC data collection practices, it is unknown to what extent the current outreach operations contribute to or detract from ZAZIC VMMC targets. To improve ZAZIC program monitoring and provide better care to VMMC clients, this study aims to evaluate the M&E data collected via REDCap to identify and address factors contributing to or detracting from ZAZIC program success.

Methods

Procedures

Data for this study were collected between July 2019 and March 2020. ZAZIC roving team members completed a web-based outreach report via REDCap consisting of daily outreach statistics and information. Each report had a quantitative portion collecting information on information such as outreach hours, staffing, and demand creation (DC) activities completed. Reports also provided team members the opportunity to share qualitative comments on service delivery, DC, follow-up, and miscellaneous comments. Quantitative data were analyzed using R Studio. Qualitative data were analyzed using ATLAS.ti.

Data Analysis Strategy

Descriptive analysis examined the frequencies, means, medians, and inter-quartile ranges for all variables used in this evaluation. Univariate linear regression models determined whether key factors of interest were significantly associated with target program outputs at each partner level and within ZAZIC overall. Factors significant at the $p<0.05$ level in univariate models were included in multivariate models. In this study, target outputs and success was defined by the total VMMCs completed and total VMMCs completed in clients between the ages 15-29. Factors of interest included staff characteristics, scheduling characteristics, visit characteristics, DC activities, and giveaways completed. All quantitative data analysis was completed using RStudio. Qualitative data were coded using Atlas.ti and thematically analyzed to complement quantitative analysis.

Results (Quantitative)

Descriptive statistics

Of 1,773 outreach visit events reported to REDCap, 960 (54%) events were reported by ZACH and 813 (45.9%) were reported by ZICHIRE. ZAZIC outreach characteristics were similar between both partners (Table 1).

Factors Contributing to total VMMCs Completed

Results from univariate and multivariate linear regression models of factors influencing total VMMCs completed by ZAZIC partner are presented in Table 2 (Columns 2, 3 for ZACH, 3, 4 for ZICHIRE, and 5, 6 for combined ZAZIC).

ZACH

ZAZIC clinicians (1.36; 95% CI: 0.48 – 2.24), ZAZIC non-clinical staff (2.19; 95% CI: 1.38-3.0), site clinicians (1.84; 95% CI: 1.41 – 2.3), and non-clinical site staff (2.45; 95% CI: 2.05 – 2.86) were significantly associated with increased total VMMCs completed. In the multivariate model, associations between staff characteristics and total VMMCs among ZACH clinics remained significant in all staffing variables except non-clinical site staff. Furthermore, the strength of associations between ZAZIC clinicians and total VMMCs increased, while the strength of association between ZAZIC non-clinical staff and total VMMCs and site clinicians and total VMMCs diminished in the multivariate model.

Day 2 follow-ups scheduled (0.15; 95% CI: 0.08 – 0.21) and reviewed (0.12; 95% CI: 0.05-0.19) were significantly associated with total VMMCs. These results were similar to Day 7 Follow-Ups scheduled (0.13; 95% CI: 0.06 – 0.19) and Day 7 Follow-Ups reviewed (0.11; 95% CI: 0.04 – 0.18). In multivariate analysis, these associations change, with a significant positive association between Day 7 Follow-Ups Scheduled (0.13; 95% CI: 0.06 – 0.21) and mean total VMMCs, and

a significant negative association between Day 7 Follow-Up Reviewed (0.11; 95% CI: 0.04, 0.18) and total VMMCs.

The total number of hours outreach was open (3.3; 95% CI: 3.11 – 3.5), kilometers traveled to an outreach site (0.03; 95% CI: 0.02 – 0.05), and number of DC activities completed each day (2.3; 95% CI: 1.03 – 3.56) were significantly associated with the total VMMCs completed by ZACH. . In multivariate analysis, this association between outreach length and total VMMCs as well as kilometers traveled and total VMMCs remains similar and significant, but was not significant with the number of DC activities and total VMMCs.

ZICHIRE

Among staffing characteristics at ZICHIRE VMMC sites, ZAZIC clinicians (2.41; 95% CI: 1.00 – 2.51), site clinicians (0.56; 95% CI: 0.19 – 0.92), and non-clinical site staff (0.22; 95% CI: -0.18 – 0.63) were significantly associated with total VMMCs completed by ZICHIRE. These associations remained significant but with diminished strength in the multivariate model. Day 2 Follow-Ups Scheduled (0.15; 95% CI: 0.08 – 0.21) and Day 2 Follow-Ups Reviewed (0.12; 95% CI: 0.5, 0.19) were associated with total VMMCs. Similarly, Day 7 Follow-Ups Scheduled (0.13; 95% CI: 0.06 – 0.19) and Day 7 Follow-Ups Reviewed (0.11; 95% CI: 0.04, 0.18) were also significantly associated with total VMMCs. In multivariate analysis, only the association between Day 7 Follow-Ups scheduled and total VMMCs remained significant. Among visit characteristics, there was strong evidence that outreach length (2.17; 95% CI: 1.95 – 2.38), kilometers traveled (0.04; 95% CI: 0.03 – 0.05), and number of DC activities completed (3.64; 95% CI: 3.15 – 4.12) were associated with total VMMCs performed. Kilometers traveled and total DC remained significant with diminished strength in multivariate analysis.

ZAZIC Overall

There is evidence that, with the exception of ZAZIC non-clinical staff, all characteristics pertaining to staffing, scheduling, and visits listed in Table A were associated with total VMMCs. In multivariate analysis, ZAZIC clinician, outreach length, kilometers traveled, and total Demand Creation completed remained significant with diminished strength.

Factors Contributing to total VMMCs Completed Among 15-29 Age Group

Table 3 describes the results from univariate and multivariate linear regression models of factors influencing total VMMCs by ZAZIC partner (Columns 2, 3 for ZACH, 3, 4 for ZICHIRE, and 5, 6 for combined ZAZIC).

ZACH

All staff characteristics including ZAZIC clinician (1.16; 95% CI: 0.51 – 1.81), ZAZIC non-clinical staff (0.74; 95% CI: 0.13 – 1.34), site clinicians (1.10; 95% CI: 0.82 – 1.39), and non-clinical site staff (1.34; 95% CI: 1.03 – 1.65) were significantly associated with the total VMMCs among clients ages 15-29 completed by ZACH. In the multivariate analysis, the presence of a ZAZIC clinician and site clinician at an outreach remained significantly associated with VMMCs in this age group.

Scheduling characteristics were significantly associated with VMMCs completed in this age group. Scheduling characteristics include Day 2 Follow-Ups scheduled (0.07; 95% CI: 0.02 – 0.11) and reviewed (0.07; 95% CI: 0.02 – 0.12), along with Day 7 Follow-Ups scheduled (0.06; 95% CI: 0.01 – 0.10) and reviewed (0.07; 95% CI: 0.01 – 0.12). In multivariate analysis, these associations did not remain significant.

Visit characteristics significantly associated with VMMCs in the 15-29 age group were outreach length in hours (1.89; 95% CI: 1.71 – 2.07) and kilometers traveled to a site (0.01; 95%

CI: 0.00 – 0.02). In multivariate analysis, outreach length remained significantly associated with total VMMCs in age 15-29.

ZICHIRE

Clinic staffing characteristics significantly associated with VMMCs among clients ages 15-29 were ZAZIC clinician (1.03; 95% CI: 0.41 – 1.64), site clinician (1.33; 95% CI: 1.16 – 1.49), and non-clinical site staff (0.56; 95% CI: 0.38 – 0.74). In multivariate analysis, ZAZIC clinicians and site clinicians remained significantly associated with VMMCs in the 15-19 age group, but with diminished strength.

Scheduling characteristics were significantly associated with VMMCs in the 15-29 age group. Day 2 Follow-Up appointments scheduled (0.19; 95% CI: 0.15 – 0.23) and reviewed (0.18; 95% CI: 0.14 – 0.23) along with Day 7 appointments scheduled (0.24; 95% CI: 0.20 – 0.38) and reviewed (0.23; 95% CI: 0.18 – 0.29) significantly influenced total VMMCs for 15-29 year old clients. In multivariate analysis, Day 2 Follow-Ups scheduled and Day 7 Follow-Ups scheduled remained significantly with diminished strength to VMMCs in this age group.

Outreach length (1.27; 95% CI: 1.12 – 1.43), kilometers traveled (0.03; 95% CI: 0.02 – 0.03), and number of DC activities completed (1.79; 95% CI: 1.45 – 2.14) also had a significant influence on VMMCs among this age group. In multivariate analysis, these associations remained significant with decreased strength.

ZAZIC Overall

In univariate analysis, all staff, scheduling, and visit characteristics were significantly associated with VMMCs in clients ages 15-29 across ZAZIC. In multivariate analysis, the association between ZAZIC clinicians, site clinicians, outreach length, and kilometers traveled with VMMCs completed in the target age group remained significant with diminished strength.

Comparison of Demand Creation and Giveaway Frequency by Partner

Frequency data on DC and giveaway activities is described in Table 4. Of 2,428 total activities conducted, 887 (36.5%) were completed by ZACH and 63.5% were completed by ZICHIRE.

Demand Creation Activities Contributing to total VMMCs Completed

Table 5 describes the results from univariate and multivariate linear regression models of DC factors influencing total VMMCs by ZAZIC partner (Columns 2, 3 for ZACH, 3, 4 for ZICHIRE, and 5, 6 for combined ZAZIC).

ZACH

Soccer (27.57; 95% CI: 23.23 – 31.91), moonlighting (24.92; 95% CI: 12.15 – 37.68), road shows (20.6; 95% CI: 15.88 – 25.33), tent-based campaigns (11.77; 95% CI: 3.91 – 19.64) and other DC activities (-5.02; 95% CI: -7.33 - -2.71) were significantly associated with total VMMCs completed. All of these significantly associated DC activities had a positive association with total VMMCs except for other, unspecified activities. Giveaways including T-shirts (9.77; 95% CI: 7.60 – 11.95) and other, undefined giveaways (8.95; 95% CI: 5.99 – 11.92) also significantly influenced total VMMCs. In multivariate analysis, soccer, road shows, unspecified DC, t-shirt giveaways, and unspecified giveaways remained significant with overall diminished strength.

ZICHIRE

Demand creation activities significantly associated with total VMMCs include moonlighting (9.52; 95% CI: 5.05 – 13.97), community dialogue (4.49; 95% CI: 3.04 – 5.95), and road shows (9.40; 95% CI: 7.35 – 11.44). T-shirt giveaways were also significantly associated with total VMMCs (5.86; 95% CI: 4.66 – 7.07). Moonlighting, road shows, tent-based campaigns,

interpersonal dialogue, other DC activities, and t-shirt giveaways remained significant with diminished strength in multivariate analysis.

ZAZIC Overall

Demand Creation activities significantly associated with VMMCs completed by ZAZIC include soccer, moonlighting, road shows, tent based campaigns, and other unspecified DC activities. T-shirt giveaways also significantly influenced total VMMCs. In multivariate analysis, all activities except other unspecified activities remained significantly associated with VMMCs with increased strength in association.

Demand Creation Activities Contributing to total VMMCs Completed among age 15-29 group

Results from univariate and multivariate linear regression models of Demand Creation factors influencing total VMMCs completed by ZACH among age 15-29 are presented in Table D (Columns 2, 3 for ZACH, 3, 4 for ZICHIRE, and 5, 6 for combined ZAZIC).

ZACH

Soccer (14.45; 95% CI: 11.25 – 17.66), moonlighting (13.14; 95% CI: 3.83 – 22.44), road shows (10.95; 95% CI: 7.48 – 14.47), and other unspecified DC activities (-3.19; 95% CI: -4.88 – 1.50) were significantly associated with total VMMCs in the 15-29 age range. Of these activities, all were positively associated with 15-29 VMMCs except for other unspecified activities, which had a negative association. Giveaways including T-shirts (5.53; 95% CI: 3.88 – 7.17) and other unspecified giveaways (5.62; 95% CI: 3.40 – 7.84) also significantly influenced 15-29 VMMCs. In multivariate analysis, soccer, road shows, other DC activities, and other giveaways remained significantly associated with total VMMCs in the age 15-29 group.

ZICHIRE

DC activities significantly associated with VMMCs in the 15-29 age group were soccer (6.99; 95% CI: 2.9 – 11.08), moonlighting (4.67; 95% CI: 1.67 – 7.68), community dialogue (1.93; 95% CI: 0.93 – 2.92), road shows (5.29; 95% CI: 3.90 – 6.69), tent-based campaigns (4.17; 95% CI: 3.26 – 5.08), and interpersonal dialogue (1.97; 95% CI: 1.14 – 2.80). T-shirt giveaways (3.78; 95% CI: 2.96 – 4.59) also significantly influenced VMMCs in this age group. All associations between activities and total VMMCs remained significant with diminished strength in multivariate analysis.

ZAZIC Overall

Across ZAZIC, DC activities significantly influencing VMMCs among 15-29-year-old clients include soccer, moonlighting, road shows, tent based campaigns, and unspecified DC activities. Of these activities, all were positively associated except for unspecified DC activities, which were negatively associated with VMMCs in this age group. T-shirt giveaways were also significantly associated with increased VMMCs in this age group. In multivariate analysis, associations between soccer, moonlighting, road shows, tent-based campaigns, and t-shirt giveaways with increased VMMCs in the 15-29 age group remained significant with increased strength in association.

Results (Qualitative)

Optional qualitative comments submitted by ZAZIC roving team members via the REDCap mobile app provided insight on program barriers and facilitators related to service delivery, follow-up, and DC. Qualitative analysis also identified common requests to improve ZAZIC VMMC programming as well as insight on phrases and terms possibly indicating an unreported AE.

Service Delivery

Having at least two vehicles, having a caravan to complete mobile VMMCs, and coordinating service delivery on days complementing students' client schedules facilitated and improved service delivery. Regarding the caravan, a mobile VMMC outreach method, ZAZIC staff reported, "The caravan gave us clients despite the rains." ZAZIC staff reported "good numbers on a Saturday," "good numbers on school closing day," and "good numbers on holiday" as factors contributing to VMMCs completed. Furthermore, ZAZIC staff credited outreach dates aligning with school academic schedules increased VMMCs, reporting an "increase in output because most schools finished end of year examinations."

Primary barriers to service delivery were weather and scheduling conflicts. Service delivery was frequently interrupted by heavy rains and rain-related issues where "the team could not access most of the booked clients due to heavy rains and muddy roads." High temperatures were also an issue to completing VMMCs, where "most clients were not willing to be circumcised because of extremely high temperatures." Scheduling conflicts were a barrier to service delivery because all clients, both in the 15-29 age group and outside this age group, were unavailable to be circumcised. One report detailed they "could not meet the site daily target since mobilized clients were busy with end of year exams and field work since it's not rain season."

Follow-Up

The main facilitator to following up with clients after VMMC was reaching clients by phone. Clients were often unavailable or did not show up for their post-VMMC follow-up visits. ZAZIC staff reported, "some were not available for Day 7 (review) but were reachable by phone." Having phone follow-ups available expanded opportunities for successful follow-up.

On the contrary, a primary barrier to phone follow-ups was a lack of access to consistent network and electricity. One ZAZIC team member noted, “we only traced 1 client. Most client numbers were not reachable due to electricity challenges.” An additional barrier to Follow-Up post-VMMC was difficulties accessing clients for visits. Lack of access was attributed to the weather, client travel, and general difficulty tracing clients on Day 7. Of these access issues, ZAZIC staff reported, “roads difficult to use now due to rains, some clients not reviewed,” “Difficult to follow up (gold panners) for reviews as they are too mobile,” and “Day seven clients difficult to trace.”

Demand Creation

Facilitators for successful demand creasing increasing VMMC were collaborating with local dance groups and involving women in DC activities. One ZAZIC member reported, “the roadshow was very fruitful due thanks to the invitation of a new dance group.” One other report mentioned, “involvement of women in our campaigns has showed to bring good and positive response from the adult males.” Both dance groups and female participation in DC was beneficial to all DC activities.

Similar to barriers to service delivery, weather was also a barrier to DC, along with access to vehicles. A frequent report about weather affecting DC was “Demand creation activities affected by heavy rains, damaged roads and slippery roads.” Access to vehicles interrupted the ability to complete DC, with one report detailing, “No DC activities done today since there was one vehicle which was dedicated to service delivery and reviews.” Because completing VMMCs and reviewing clients for AEs is of the highest priority, DC activities were often a low priority when access to resources was limited.

Requests for Assistance

REDCap comments revealed several requests teams have for improving both service delivery and DC among clients. ZICHIRE requested more promotional materials such as t-shirts to reach both adult clients and clients of the 15-29 age group, stating, “there is need for promotional material such as t-shirts & hats to reach the 15-29 age group.” ZACH specifically requested more underwear to distribute to clients after a procedure, noting that “most clients from rural areas do not have underwear which result in swelling of the circumcised penis. Procurement of underwear should be considered as a state of emergency.” ZICHIRE also suggested an increase in road shows and community dialogues for DC, as well as increased education for parents surrounding the value of VMMC and addressing myths about HIV and circumcision. One comment reported, “they believe this [HIV testing] will expose their own HIV status and fear other people knowing. There’s belief that a circumcised man will only have two children his entire life or have children with disabilities or deformities.” ZICHIRE teams suggested more community dialogues to address similar concerns within the community.

Adverse Event (AE) Terminology

In these reports, ZAZIC used a variety of words and phrases that indicated possible adverse events (AEs) that were not reported in the AE section of the REDCap form. Examples include “mild penial swelling,” “difficult voiding” and “problems with healing.” Other examples that indicated a possible AE without an AE reported include “Clients seen with problems noted” and “2 day seven plus clients reported to be having problems with healing were also seen.”

Discussion

Using mixed methods, namely a quantitative analysis of outreach data reported to REDCap and qualitative of accompanying comments, this study explored factors contributing to ZAZIC VMMC program success. Triangulation of results illuminated the many factors associated with increasing VMMCs as a program overall, and specifically within the 15-29 age group. As expected, both quantitative and qualitative results revealed factors significantly associated with increased VMMCs across both groups (Table 7).

As expected, service delivery improved with increased resources including personnel, hours spent engaging in outreach, and working vehicles. These results support the idea that increased resources are aligned with increased output. In particular, the qualitative results highlighted the importance of vehicle accessibility to successful service delivery and demand creation. When vehicles are out of service or unavailable due to issues such as tire punctures and higher priority outreach activities, clients can not be easily reached and service delivery is impacted. These results were gathered from qualitative data but were not included in quantitative data collection. Future data collection should factor in vehicle data for program monitoring and explore its association with service delivery.

This study confirmed DC activities are strongly and significantly associated with VMMC outreach, as previous studies have indicated (Sgaier et al., 2016). Qualitative results suggested this association can be further attributed to two factors; caravans provided concurrent VMMC service delivery during DC events, and DC activities provided opportunities for community involvement and engagement. Given that a majority of ZAZIC's VMMCs are attributed to outreach or caravans, these results provide new insight into the relationship between mobile caravans and DC in

supporting VMMC outreach (Bochner et al., 2017). Regularly including caravans and community involvement in DC activities could further increase VMMC outreach by increasing accessibility and convenience for clients while providing a sense of community ownership.

Follow-ups are critical for early detection of AEs in VMMC to ensure quality of care and client safety (Byabagambi et al., 2015). In-person follow-ups were significantly associated with VMMC, however, the strength of association was very low. Furthermore, qualitative results revealed clients often did not show up for scheduled follow-ups primarily due to access and perception of the need for follow-up. Findings from this study suggest that in-person follow-ups may not be as helpful in identifying AEs as intended and may also interfere with opportunities for VMMC outreach. Though AEs in VMMC are rare, it is important to continue follow-ups in some capacity (Bochner et al., 2017). Alternatives to in-person follow-ups, such as reviews done by phone, should be explored as standard outreach procedures.

ZAZIC qualitative comments provided insightful recommendations to improving the VMMC program. Team members requested more underwear to aid in healing and service delivery, an issue supported in prior research (Reed et al., 2015). Clients responded well to promotional materials and giveaways, with increased outreach in both qualitative and quantitative results. This is likely because promotional materials allow for passive demand creation at an individual level outside of standard ZAZIC DC activities. For example, clients may wear t-shirts supporting VMMC to class or around their community, use writing materials in school, and more, drawing interest and curiosity from potential clients. These materials should be considered in outreach preparation to improve both service delivery and demand creation outcomes.

Limitations

The REDCap reporting period was shorter than anticipated due to COVID-19 restrictions placed throughout Zimbabwe interrupting VMMC service delivery. Furthermore, because this analysis focused on REDCap reports submitted between July 2019 and March 2020, some fields were prone to missing data completely at random. As a result, the data required imputation of "0" for variables surrounding staffing, outreach length, distance traveled, and follow-ups. Imputation was decided after reviewing prior paper-based forms and establishing that ZAZIC members often left fields blank if there was no data to report. While these variables having missing data on the physical forms, they were manually imputed by administrators at the ZAZIC central office, thus justifying the decision to impute REDCap data. In addition to some fields with data missing completely at random, the REDCap data required time consuming data cleaning. Often, non-numerical characters such as letters and symbols were entered in fields collecting numerical values. For example, many fields had "O" in place of "0" for quantitative variables.

Chapter 4. Conclusions and Future Directions

This mixed-methods, retrospective, cross-sectional analysis has added to the literature on electronic data collection and VMMC program monitoring and evaluation in several ways. First, the analysis applying the RE-AIM framework indicated that using a web-based, electronic data collection tool with offline collection capabilities such as the REDCap mobile app is both feasible and effective in reducing data collection errors seen in paper-based forms. This reinforces the importance of incorporating alternatives to paper-based data collection to improve VMMC program monitoring and evaluation. More importantly, this analysis provided robust data to complete an in-depth mixed-methods analysis of program factors on ZAZIC VMMC productivity.

The mixed-methods study conducting using data submitted via REDCap revealed that DC activities were the most influential factor in increasing VMMCs across all ages, but specifically the 15-29 age group. Furthermore, this data revealed that low VMMCs and subsequent REDCap reports could be primarily attributed to a mix of barriers related to weather and scheduling conflicts. This mixed-methods study also explored direct recommendations from ZAZIC to improve productivity and provided insight into current and future AE reporting.

In summary, REDCap is an effective tool for ZAZIC VMMC data collection and should continue as the primary method of data entry. There continues to be a need to continue facilitating factors associated with increasing VMMCs while addressing barriers and requests related to VMMC success and productivity. As ZAZIC returns to normal operating capacity, it is critical to review training on REDCap data reporting to ensure data quality.

While these studies aim to improve ZAZIC VMMC programming and service delivery, the studies were preliminary in nature with a short reporting observation period. This work should be

replicated once COVID-19 restrictions are fully lifted and ZAZIC can return to operating at full capacity. This would allow for a better grasp of REDCap maintenance and allow for a better understanding of the impact of weather and scheduling on service delivery and DC.

References

Auvert, B., Taljaard, D., Lagarde, E., Sobngwi-Tambekou, J., Sitta, R., & Puren, A. (2005). Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: The ANRS 1265 Trial. *PLos Med*, *2*(11), e298.

Bailey, R. C., Moses, S., Parker, C. B., Agot, K., Maclean, I., Krieger, J. N., Williams, C. F., Campbell, R. T., & Ndinya-Achola, J. O. (2007). Male circumcision for HIV prevention in young men in Kisumu, Kenya: A randomised controlled trial. *The Lancet*, *369*(9562), 643–656.

Bochner, A. F., Feldacker, C., Makunike, B., Holec, M., Murenje, V., Stepaniak, A., Xaba, S., Balachandra, S., Tshimanga, M., & Chitimbire, V. T. S. (2017). Adverse event profile of a mature voluntary medical male circumcision programme performing PrePex and surgical procedures in Zimbabwe. *Journal of the International AIDS Society*, *20*(1), 21394.

Byabagambi, J., Kigonya, A., Lawino, A., Ssensamba, J. T., Twinomugisha, A., & Karamagi-Nkolo, E. (2015). A guide to improving the quality of safe male circumcision in Uganda. *A Guide to Improving the Quality of Safe Male Circumcision in Uganda*.

Feldacker, C., Makunike-Chikwinya, B., Holec, M., Bochner, A. F., Stepaniak, A., Nyanga, R., Xaba, S., Kilmarx, P. H., Herman-Roloff, A., & Tafuma, T. (2018). Implementing voluntary medical male circumcision using an innovative, integrated, health systems approach: Experiences from 21 districts in Zimbabwe. *Global Health Action*, *11*(1), 1414997.

Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health*, *89*(9), 1322–1327.

Gray, R. H., Kigozi, G., Serwadda, D., Makumbi, F., Watya, S., Nalugoda, F., Kiwanuka, N., Moulton, L. H., Chaudhary, M. A., & Chen, M. Z. (2007). Male circumcision for HIV prevention in men in Rakai, Uganda: A randomised trial. *The Lancet*, *369*(9562), 657–666.

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, *42*(2), 377–381.

Ministry of Health and Child Care. (2019). *Sustainability Transition Implementation Plan 2019 – 2021 VOLUNTARY MEDICAL MALE CIRCUMCISION.*

Ministry of Health and Child Care. (2020). *Zimbabwe Population-Based HIV Impact Assessment (ZIMPHIA) 2020*. https://zw.usembassy.gov/wp-content/uploads/sites/178/ZIMPHIA-2020-Summary-Sheet-FINAL.pdf

Ndlovu, K., Maucob, K. L., Groverc, S., Kovarik, C., & Williams, V. L. (2019). Evaluation of REDCap as an alternative data management and quality improvement tool for cutaneous lymphoma care in Botswana. *In Africa Conference*, 51.

Reed, J., Grund, J., Liu, Y., Mwandi, Z., Howard, A. A., McNairy, M. L., & Bock, N. (2015). Evaluation of loss-to-follow-up and post-operative adverse events in a voluntary medical male circumcision program in Nyanza Province, Kenya. *J Acquir Immune Defic Syndr*, *69*(1), e13-23.

Sgaier, S. K., Reed, J. B., Sundaram, M., Brown, A., Djimeu, E., & Ridzon, R. (2016). Interventions to drive uptake of voluntary medical male circumcision—A collection of impact evaluation evidence. *Journal of Acquired Immune Deficiency Syndromes (1999)*, *72*(Suppl 4), S257.

UNAIDS, W. (2011). Joint strategic action framework to accelerate the scale-up of voluntary medical male circumcision for HIV prevention in eastern and southern Africa, 2012–2016. *Geneva: WHO*.

World Health Organization. (2013). *Progress in scaling up voluntary medical male circumcision for HIV prevention in East and Southern Africa, January–December 2012*.

Table 1: Descriptive Statistics of outreach characteristics by partner

	ZACH N = 960				ZICHIRE N = 813				Overall N = 1,773			
Characteristic	Obs	Mean	Median	IQR	Obs	Mean	Median	IQR	Obs	Mean	Median	IQR
MC Characteristics												
Total MCs	899	17.83	17	11-13	801	13.47	11	7-19	1704	15.79	15	8-21
MCs Age 15-29	859	10.68	10	6-14	793	7.08	6	3-10	1656	8.90	8	4-12.3
Staff Characteristics												
ZAZIC Clinician	956	1.88	2	1-2	813	1.6	2	1-2	1773	1.75	2	1-2
ZAZIC Non-Clinician Staff	956	1.61	1	1-2	813	2.53	2	2-4	1773	2.03	2	1-3
Site Clinician	956	2.70	2	1-4	813	3.84	4	2-5	1773	3.32	3	2-5
Site Non-Clinician Staff	956	2.6	2	1-4	813	4.37	4	2-6	1773	3.42	3	2-5
Scheduling Characteristics												
D2 Follow Up Scheduled	956	7.71	0	0-16.3	813	8.47	6	0-13	1773	8.06	3	0-15
D2 Follow Up Reviewed	956	6.90	0	0-15	813	7.9	6	0-13	1773	7.36	2	0-14
D7 Follow Up Scheduled	956	8.60	0	0-17	813	11.99	10	5-17	1773	10.16	8	0-17
D7 Follow Up Reviewed	956	6.51	0	0-12	813	8.02	7	3-11	1773	7.15	5	0-11
Site Characteristics												
Clinic Length	951	4.9	5.25	3.5-6.7	807	5.66	6	4.3-7.3	1762	5.25	5.57	4-7
Mileage	731	163.8	150.0	113-204.5	725	102.75	90	21-165	1459	133.37	128	70-185

Table 2. Results from univariate and multivariate linear regression models assessing program factors affecting total VMMCs by Partner.

Characteristics	ZACH		ZICHIRE		Overall	
	Univariate	Multivariate	Univariate	Multivariate	Univariate	Multivariate
Staff Characteristics						
ZAZIC Clinician	1.36** (0.48, 2.24)	1.75*** (1.00, 2.51)	2.41*** (1.50, 3.32)	2.24*** (1.56, 2.93)	2.23*** (1.61, 2.86)	2.52*** (1.99, 3.04)
ZAZIC Non-Clinician Staff	2.19*** (1.38, 3.00)	0.76* (0.08, 1.43)	-0.11 (-0.64, 0.42)		-0.10 (-0.54, 0.34)	
Site Clinician	1.84*** (1.41, 2.30)	0.56** (0.19, 0.92)	2.21*** (1.97, 2.44)	0.42** (0.10, 0.74)	1.65*** (1.42, 1.87)	0.21 (-0.04, 0.46)
Site Non-Clinician Staff	2.45*** (2.05, 2.86)	0.22 (-0.18, 0.63)	0.95*** (0.68, 1.22)	0.07 (-0.19, 0.31)	0.91*** (0.68, 1.14)	-0.20 (-0.43, 0.03)
Scheduling Characteristics						
D2 Follow Up Scheduled	0.15*** (0.08, 0.21)	-0.03 (-0.13, 0.07)	0.33*** (0.27, 0.39)	0.26 (-0.04, 0.55)	0.21*** (0.16, 0.26)	0.04 (-0.05, 0.14)
D2 Follow Up Reviewed	0.12*** (0.05, 0.19)	0.08 (-0.02, 0.19)	0.33*** (0.26, 0.40)	-0.17 (-0.48, 0.14)	0.19*** (0.14, 0.24)	0.04 (-0.06, 0.14)
D7 Follow Up Scheduled	0.13*** (0.06, 0.19)	0.13*** (0.06, 0.21)	0.44*** (0.38, 0.49)	0.21*** (0.10 0.32)	0.21*** (0.16, 0.25)	0.11** (0.04, 0.17)
D7 Follow Up Reviewed	0.11** (0.04, 0.18)	-0.08* (-0.17, 0.00)	0.47*** (0.40, 0.55)	-0.08 (-0.21, 0.06)	0.20*** (0.15, 0.26)	-0.05 (-0.12, 0.02)
Visit Characteristics						
Clinic Length	3.30*** (3.11, 3.50)	3.06*** (2.81, 3.31)	2.17*** (1.95, 2.38)	0.07 (1.15, 1.58)	2.70*** (2.55, 2.86)	2.42*** (2.24, 2.59)
Kilometers Traveled	0.03*** (0.02, 0.05)	0.02*** (0.01, 0.03)	0.04*** (0.03, 0.05)	0.02*** (0.01, 0.03)	0.04*** (0.04, 0.05)	0.03*** (0.03, 0.04)
Total Demand Creation Activities Completed	2.30*** (1.03, 3.56)	0.54 (-0.49, 1.57)	3.64*** (3.15, 4.12)	1.38*** (0.94, 1.81)	2.31*** (1.78, 2.84)	0.48* (0.04, 0.92)

Notes: Results from linear regression. Clinicians are defined by whether they were provided by ZAZIC or the site. Non-clinical staff consist of demand creation officers, clerks, drivers, etc. D2 and D7 stand for 2 days and 7 days post-MC, respectively. Clinic length refers to the hours a clinic is open to patients each day. Total Demand Creation Activities Completed represents the sum of activities executed during a clinic.
95% CI in parenthesis
$*p \leq .05$; $**p \leq 0.01$; $***p \leq .0.001$

Table 3: Results from univariate and multivariate linear regression models assessing program factors affecting total VMMCs on clients age 15-29 by Partner

	ZACH		ZICHIRE		Overall	
	Univariate	Multivariate	Univariate	Multivariate	Univariate	Multivariate
Staff Characteristics						
ZAZIC Clinician	1.16*** (0.51, 1.81)	1.75*** (1.02, 2.48)	1.03** (0.41, 1.64)	1.20*** (0.66, 1.74)	1.54*** (1.09, 1.99)	1.93*** (1.46, 2.42)
ZAZIC Non-Clinician Staff	0.74* (0.13, 1.34)	-0.10 (-0.73, 0.54)	-0.15 (-0.51, 0.20)		-0.44** (-0.76, -0.13)	-0.28 (-0.60, 0.04)
Site Clinician	1.10*** (0.82, 1.39)	0.43* (0.06, 0.79)	1.33*** (1.16, 1.49)	0.29* (0.04, 0.54)	0.92*** (0.76, 1.09)	0.23* (0.01, 0.45)
Site Non-Clinician Staff	1.34*** (1.03, 1.65)	0.17 (-0.23, 0.57)	0.56*** (0.38, 0.74)	0.03 (-0.17, 0.23)	0.41*** (0.24, 0.57)	-0.20 (-0.40, 0.00)
Scheduling Characteristics						
D2 Follow Up Scheduled	0.07** (0.02, 0.11)	-0.08 (-0.18, 0.02)	0.19*** (0.15, 0.23)	0.28* (0.05, 0.51)	0.11*** (0.07, 0.14)	-0.03 (-0.11, 0.05)
D2 Follow Up Reviewed	0.07* (0.02, 0.12)	0.10 (0.00, 0.20)	0.18*** (0.14, 0.23)	-0.24 (-0.48, 0.01)	0.1*** (0.07, 0.14)	0.08 (0.00, 0.16)
D7 Follow Up Scheduled	0.06* (0.01, 0.10)	0.06 (-0.01, 0.14)	0.24*** (0.20, 0.38)	0.14** (0.05, 0.22)	0.10*** (0.07, 0.13)	0.05 (0.00, 0.11)
D7 Follow Up Reviewed	0.07* (0.01, 0.12)	-0.04 (-0.12, 0.04)	0.23*** (0.18, 0.29)	-0.10 (-0.20, 0.00)	0.10*** (0.06, 0.14)	-0.03 (-0.10, 0.03)
Visit Characteristics						
Clinic Length	1.89*** (1.71, 2.07)	1.74*** (1.48, 2.00)	1.27*** (1.12, 1.43)	0.89*** (0.72, 1.06)	1.55*** (1.42, 1.67)	1.44*** (1.28, 1.60)
Kilometers	0.01** (0.00, 0.02)	0.00 (0.00, 0.01)	0.03*** (0.02, 0.03)	0.01*** (0.01, 0.02)	0.02*** (0.02. 03)	0.02*** (0.01, 0.02)
Total Demand Creation Activities Completed	0.79 (-0.16, 1.74)		1.79*** (1.45, 2.14)	0.36* (0.02, 0.71)	0.87*** (0.49, 1.26)	-0.15 (-0.54, 0. 24)

Notes: Results from linear regression. Clinicians are defined by whether they were provided by ZAZIC or the site. Non-clinical staff consist of demand creation officers, clerks, drivers, etc. D2 and D7 stand for 2 days and 7 days post-MC, respectively. Clinic length refers to the hours a clinic is open to patients each day. Total Demand Creation Activities Completed represents the sum of activities executed during a clinic.
95% CI in parenthesis
$^*p \leq .05$; $^{**}p \leq 0.01$; $^{***}p \leq .0.001$

Table 4: Comparison of Demand Creation and Giveaway Frequency by Partner

	Soccer	Moonlighting	Community Dialogue	Road Show	Tent-Based Campaign	Interpersonal Dialogue	Other DC Activity	T-Shirt Giveaway	Other Giveaway	Total
ZACH	25	3	12	21	8	539	105	113	61	887
ZICHIRE	9	16	174	72	199	485	92	292	202	1,541
Total	34	19	186	93	207	1,024	197	405	263	2,428

Table 5: Results from univariate and multivariate linear regression models assessing Demand Creation activities affecting total VMMCs by Partner.

	ZACH		ZICHIRE		Overall	
	Univariate	Multivariate	Univariate	Multivariate	Univariate	Multivariate
DC Activity						
Soccer	27.57*** (23.23, 31.91)	24.56*** (20.18, 28.93)	5.21 (-0.92, 11.35)		22.59*** (19.03, 26.16)	21.51*** (18.03, 24.99)
Moonlighting	24.92*** (12.15, 37.68)	4.83 (-6.91, 16.57)	9.52*** (5.05, 13.97)	10.69*** (6.85, 14.53)	10.43*** (5.60, 15.26)	8.34*** (3.86, 12.81)
Community Dialogue	4.56 (-2.16, 11.33)		4.49*** (3.04, 5.95)	1.05 (-0.32, 2.42)	1.71* (0.1, 3.30)	-1.61* (-3.22, -0.01)
Road Show	20.6*** (15.88, 25.33)	17.33*** (12.61, 22.04)	9.40*** (7.35, 11.44)	6.92*** (4.95), 8.88)	10.33*** (8.20, 12.45)	8.30*** (6.13, 10.47)
Tent-Based Campaign	11.77** (3.91, 19.64)	-3.55 (-10.81, 3.72)	7.29*** (5.97, 8.62)	4.89*** (3.55, 6.23)	4.06*** (2.55, 5.57)	1.95* (0.37, 3.52)
Interpersonal Dialogue	-0.47 (-1.97, 1.03)		4.86*** (3.66, 6.06)	2.78*** (1.63, 3.94)	1.86*** (0.85, 2.86)	1.94*** (0.99, 2.90)
Other	-5.02*** (-7.33, -2.71)	-4.59*** (-6.62, -2.56)	2.62** (0.71, 4.54)	2.16* (0.51, 3.81)	-1.45 (-3.01, 0.11)	
Giveaways						
T-Shirts	9.77*** (7.60, 11.95)	2.52* (0.24, 4.80)	5.86*** (4.66, 7.07)	2.66*** (1.44, 3.87)	5.16*** (4.02, 6.31)	1.89** (0.64, 3.13)
Other	8.95*** (5.99, 11.92)	4.20** (1.47, 6.93)	0.21 (-1.20, 1.62)		0.77 (-0.61, 2.15)	

Notes: Results from linear regression.
95% CI in parenthesis
*$p \leq .05$; **$p \leq 0.01$; ***$p \leq .0.001$

Table 6: Results from univariate and multivariate linear regression models assessing Demand Creation activities affecting total VMMCs on clients age 15-29 by Partner.

	ZACH		ZICHIRE		Overall	
	Univariate	Multivariate	Univariate	Multivariate	Univariate	Multivariate
DC Activity						
Soccer	14.45*** (11.25, 17.66)	12.47*** (9.27, 15.88)	6.99*** (2.90, 11.08)	4.56* (0.82, 8.31)	13.33*** (10.81, 15.84)	20.86*** (17.38, 24.34)
Moonlighting	13.14** (3.83, 22.44)	2.21 (-6.80, 11.21)	4.67** (1.67, 7.68)	5.43*** (2.70, 8.15)	4.82** (1.38, 8.26)	8.36*** (3.87, 12.86)
Community Dialogue	2.96 (-2.18, 8.10)		1.93*** (0.93, 2.92)	-0.06 (-1.04, 0.93)	-0.07 (-1.21, 1.08)	
Road Show	10.98*** (7.48, 14.47)	8.90*** (5.26, 12.53)	5.29*** (3.90, 6.69)	3.50*** (2.11, 4.89)	5.34*** (3.80, 6.87)	8.01*** (5.83, 10.19)
Tent-Based Campaign	3.83 (-1.90, 9.57)		4.17*** (3.26, 5.08)	2.99*** (2.04, 3.95)	1.65** (0.57, 2.73)	2.08** (0.58, 3.58)
Interpersonal Dialogue	-0.69 (-1.80, 0.42)		1.97*** (1.14, 2.80)	0.88* (0.06, 1.70)	0.47 (-0.26, 1.19)	
Other	-3.19*** (-4.88, 1.50)	-2.90*** (-4.47, -1.31)	0.82 (-0.48, 2.11)		-1.28* (-2.39, -0.17)	-1.19 (-2.63, 0.26)
Giveaways						
T-Shirts	5.53*** (3.88, 7.17)	1.35 (-0.44, 3.14)	3.78*** (2.96, 4.59)	2.13*** (1.27, 2.99)	2.81*** (1.98, 3.63)	1.85** (0.61, 3.10)
Other	5.62*** (3.40, 7.84)	3.02** (0.85, 5.19)	-0.37 (-1.31, 0.58)		-0.18 (-1.17, 0.81)	

Notes: Results from linear regression.
95% CI in parenthesis
*$p \leq .05$; **$p \leq 0.01$; ***$p \leq .0.001$

Table 7. Interpretation of convergent mixed-methods results

Key Findings	Quantitative Results	Qualitative Results	Convergence & Interpretation
Increased resources promote successful service delivery	ZAZIC clinicians (2.52; CI: 1.99 – 3.04) Clinic length (2.42; CI: 2.24 – 2.59) ZAZIC clinicians (15-29) (1.93; CI: 1.46 – 2.42) Clinic Length (15-29) (1.44; CI: 1.28 – 1.60)	"Good numbers on a Saturday" "Good numbers on holiday" "There was one vehicle which was dedicated to service delivery and reviews." "Increase in output because most schools finished end of year examinations."	Service delivery improves when clients can access both outreach staff and sites, and vehicles are available to support outreach. Scheduling outreach to consider clients' schedules is key to increasing MC output.
DC activities contribute to successful outreach across all groups	Soccer (21.51; CI: 18.03 – 24.99) Moonlighting (8.34; CI: 3.86 – 12.81) Roadshows (8.30; CI: 6.13 – 10.47) Tents (1.95; CI: 0.37 – 3.52) Interpersonal Dialogue (1.94; CI: 0.99 – 2.9) T-shirts (1.89; CI: 0.64 – 3.13)	"The roadshow was very fruitful due thanks to the invitation of a new dance group." "Involvement of women in our campaigns has showed to bring good and positive response from the adult males."	As expected, DC activities involving the community improve VMMC outreach, likely due to community involvement and engagement.
Barriers to service delivery across all groups	D2 follow-up scheduled (0.04; CI: -0.05 – 0.14) D2 follow-up reviewed (0.04; CI: -0.06 – 0.14) D7 follow-up scheduled (0.11; CI: 0.04 – 0.17) D7 follow-up reviewed (-0.05; CI: -0.12 – 0.02)	"Some were not available for Day 7 (review) but were reachable by phone." "We only traced 1 client. Most client numbers were not reachable due to electricity challenges." "Difficult to follow up (gold panners) for reviews as they are too mobile," and "Day seven clients difficult to trace."	Follow-ups likely used resources necessary for VMMC outreach, resulting in low MC outputs When clients do not show up for scheduled follow-ups, resources and efforts may be difficult to re-allocate for VMMC outreach.

Appendix A: ZAZIC paper-based roving team site report

ZAZIC ROVING TEAM SITE REPORT	Roving Team Leader:													
	Mon		**Tues**		**Wed**		**Thurs**		**Fri**		**Sat**		**Sun**	
Date:														
Location of support:														
Approx travel time (to):														
Approx travel time (end):														
VMMC start time (1st client):														
VMMC end time (last client):														
Mileage (km covered):														
Level of Site support: 3= great	1 2 3		1 2 3		1 2 3		1 2 3		1 2 3		1 2 3		1 2 3	
Team members:	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE
Doctor														
Nurse circumciser														
Nurse assistant														
DCO, HPO, Community nurse														
Driver/DCFA														
Clerk														
Review nurse at rural center														
VHW/Community Mobiliser														
Others (indicate below)														
Transportation:	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE	ZAZIC	SITE
Number of Vehicles used														
Caravans used														
DC Activities:	**Mon**		**Tues**		**Wed**		**Thurs**		**Fri**		**Sat**		**Sun**	
Soccer Gala														
Snooker Tournament														
Community Dialogue														
Road Show														
Tent-Based campaign														
Interpersonal Communicat.														
Other (indicate type below)														
# of T-shirts given out														
# of other giveaways														
MCs	**Mon**		**Tues**		**Wed**		**Thurs**		**Fri**		**Sat**		**Sun**	
Daily Target:														
Total MCs Completed:														
Dorsal Slit:														
Forceps Guided:														
# 15-29														
ZAZIC vs. Site share														
# attributed to mobilizers														
Follow-up visits: Scheduled														
Follow-up visit: Reviewed														
AEs:	Date		Intervention						Management				Reported?	
Type:													Y N	
Type:													Y N	
Type:													Y N	
Type:													Y N	

Demand Creation Activities Notes (Please note DC activities that may have taken place the week prior also):

Service delivery :

Notable successes, challenges faced, recommendations (any innovative ideas?) or any additional Comments:

Challenges:

(Please also indicate any extra supplies used or needed, or notes from above)

Page 2 (backside)

ZAZIC ROVING TEAM SITE REPORT	Roving Team Leader:	

Please include any additional details/data below that may be useful to the finance team for compiling site-level costs:

This portion to be completed by Finance team:

ZAZIC ROVING TEAM SITE REPORT: Financial Data	**Name:**	

Estimated Costs:	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**	**Sat**	**Sun**	Total
Staff:								
Roving Team Salaries								
Site Team Salaries								
Outreach/other salaries								
Travel:								
Fuel (based on mileage above)								
Tolls								
Other vehicle costs								
Per Diem (lunch only)								
Per Diem (overnights)								
Supplies:								
Medical supplies								
Demand Creation supplies								
Other:								
DC Activities Cost								
Food for clients								
Estimated mobilizer payments								
Estimated PBF payment								
Total:								
MCs reported (from front):								
Estimated Cost Per MC:								

Team Members

Name & Designation	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**	**Sat**	**Sun**

NOTES:

Appendix B: ZAZIC REDCap roving team site report

ZAZIC Roving Team Site Report

Record ID (site, day month year)	______________________ (example: Kadoma, 5 July 2019)
Date:	______________________ (DD-MM-YYYY)
Data capturer	______________________ (First name and last name)
Partner:	◯ ZACH ◯ ZICHIRE (Select one)
Roving Team Leader:	______________________ (Enter team lead's first and last name.)
Location of support:	______________________ (Enter site name)
VMMC start time (1st client):	______________________ (HH:MM (24-hour clock))
VMMC end time (last client):	______________________ (HH:MM (24-hour clock))
Mileage (km covered):	______________________ (km)

ZAZIC staff in procedure room
****Please provide values for all fields. For fields with no data, please respond with "0" or "No data to report"**

	0	1	2	3	4
Doctors	◯	◯	◯	◯	◯
Nurse circumcisers	◯	◯	◯	◯	◯
Nurse assistants	◯	◯	◯	◯	◯
DCOs	◯	◯	◯	◯	◯
Drivers/DCFA	◯	◯	◯	◯	◯
Clerks	◯	◯	◯	◯	◯

Other staff	○	○	○	○	○

Specify_ZAZIC_other

____

SITE staff in procedure room
***Please provide values for all fields. For fields with no data, please respond with "0" or "No data to report"**

	0	1	2	3	4
Site Docs	○	○	○	○	○
Site nurse circumcisers	○	○	○	○	○
Site nurse assistants	○	○	○	○	○
Site DCO, HPO, community nurses	○	○	○	○	○
Site drivers/DCFA	○	○	○	○	○
Site clerks	○	○	○	○	○
Site review nurses	○	○	○	○	○
Site VHWs/community mobilizers	○	○	○	○	○
Site other staff	○	○	○	○	○

Specify_SITE_other

____

MCs

Total MCs completed:

____
(Enter number)

Dorsal slit MCs

Daily target: Dorsal slit (roving)

____
(Enter number)

Dorsal Slit MCs completed:

____
(Enter number)

DS performed in clients ages 15-29:

____
(Enter number)

DS Performed by ZAZIC

____
(Enter number)

DS Performed by Site team

____
(Enter number)

DS attributed to mobilizers:

____
(Enter number)

Forceps guided MCs

Daily target: Forceps Guided (roving)

____
(Enter number)

Forceps Guided MCs completed:

____
(Enter number)

FG performed in clients ages 15-29:

____
(Enter number)

#FG Performed by ZAZIC

____
(Enter number)

#FG Performed by Site team

____
(Enter number)

FG attributed to mobilizers:

____
(Enter number)

Device MCs

Daily target: Device (roving)

____
(Enter number)

Device MCs

____

Device performed in clients ages 15-29:

____
(Enter number)

Device Performed by ZAZIC

____
(Enter number)

Device Performed by Site team

____
(Enter number)

Device attributed to mobilizers:

____
(Enter number)

Follow-up
***Please provide values for all fields. For fields with no data, please respond with "0"**

Day 2 follow-up visits SCHEDULED: ______________________ (Enter number)

Day 2 follow-up visits REVIEWED: ______________________ (Enter number)

Day 7 follow-up visits SCHEDULED: ______________________ (Enter number)

Day 7 follow-up visits REVIEWED: ______________________ (Enter number)

Unscheduled follow-up reviews: ______________________ (Enter number)

Number of clients traced: ______________________ (Enter number)

Total Adverse Events

	Occurred
AE 1	☐
AE 2	☐
AE 3	☐

AE1 Severity:
- ◯ Mild
- ◯ Moderate
- ◯ Severe

AE1 Timing:
- ◯ A
- ◯ B
- ◯ C

Primary AE1 Type:
- ◯ AN
- ◯ BL
- ◯ DD
- ◯ IN
- ◯ OT
- ◯ PA
- ◯ SD
- ◯ SX
- ◯ WD
- ◯ OA

AE2 Severity:
- ◯ Mild
- ◯ Moderate
- ◯ Severe

AE2 Timing:	◯ A ◯ B ◯ C
Primary AE2 Type:	◯ AN ◯ BL ◯ DD ◯ IN ◯ OT ◯ PA ◯ SD ◯ SX ◯ WD ◯ OA
AE3 Severity:	◯ Mild ◯ Moderate ◯ Severe
AE3 Timing:	◯ A ◯ B ◯ C
Primary AE3 Type:	◯ AN ◯ BL ◯ DD ◯ IN ◯ OT ◯ PA ◯ SD ◯ SX ◯ WD ◯ OA

Transportation

Number of Vehicles used:	________________________
Number of Caravans used:	________________________

Demand Creation Activities (select all that apply)

	Occurred
Soccer Gala	☐
Moonlighting	☐
Community Dialogue	☐
Road Show	☐
Tent-Based campaign	☐
Interpersonal Communication	☐
Music (choral/competition)	☐

Drama ☐
Other (specify below) ☐

Other DC activity

____

Giveaways Distributed (select if given)

	Given
T-shirts	☐
Other	☐

Number of t-shirts:

____

Number of other giveaways given out:

____

Notes

Service delivery notes:

____
(Please comment)

Comments on follow-ups:

____
(Please comment)

Demand creation activities notes including activities occurring in previous week:

____
(Please comment)

Notable successes, challenges, recommendations, or other comments:

____
(Please comment)

Roving team names

____